Updates on Vaccine Hesitancy and Misinformation

Peter Hotez, MD, PhD, DSc (hon), FASTMH, FAAP
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<th>Was there a relevant Financial Disclosure</th>
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<tr>
<td>Peter Hotez, MD, PhD</td>
<td>Faculty/Presenter</td>
<td>Yes</td>
<td>Dr. Hotez is an inventor on a COVID-19 vaccine technology owned by Baylor College of Medicine that was recently licensed non-exclusively. Author of 4 books related to the geopolitics of emerging and neglected diseases published by Johns Hopkins University Press and American Society of Microbiology ASM Press.</td>
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HELLO!

Peter Hotez, MD, PhD, DSc (hon), FASTMH, FAAP

- Children’s Hospital Endowed Chair in Tropical Pediatrics
- Dean, National School of Tropical Medicine at Baylor College of Medicine
- Senior Fellow, James A Baker III Institute for Public Policy, Rice University
Learning Objectives

Participants will be able to describe global vaccine misinformation

Participants will be able to summarize the impact of mRNA COVID-19 vaccinations in the US

Participants will be able to apply the WHO Immunization Agenda for 2030
Vaccine Science VS Antiscience
Incidence of Hib in USA

- First polysaccharide Hib vaccine licensed for use in children aged ≥18 months
- First conjugate Hib vaccine licensed for use in children aged ≥18 months
- First Hib vaccines licensed for use in infants aged ≤2 months

Year
- 1980
- 1982
- 1984
- 1986
- 1988
- 1990
- 1992
- 1994
- 1996
- 2000
- 2002
- 2004
- 2006
- 2008
- 2010
- 2012

Incidence
- 0
- 5
- 10
- 15
- 20
- 25
- 30
Formation of Gavi, the Vaccine Alliance

Millennium Development Summit, September 2000

GAVI Mission

“To save children’s lives and protect people’s health through the widespread use of vaccines with a particular emphasis on developing countries”
Under 5 Child Deaths 2000–2019
GBD 2019

2000

• Measles 523,000
• Pertussis 183,000
• Tetanus 108,000
• Diphtheria 12,000
• Meningitis 231,000

2019

• Measles 70,000 (-87%)
• Pertussis 108,000 (-41%)
• Tetanus 19,000 (-82%)
• Diphtheria 3,600 (-70%)
• Meningitis 112,000 (-52%)

From GBD 2019 healthdata.org
Under 5 Deaths Averted 2000-19
Vaccine Impact Modeling Consortium
Imperial College London

▸ 36 million deaths averted through immunization
▸ 32 million Measles
▸ 1.6 million Hib
▸ 0.6 million Strep pneumo
▸ 0.15 million Rotavirus
Texas Children’s CVD
National School of Tropical Medicine
Baylor College of Medicine

- Portfolio of Global Health & Neglected Disease Vaccines
- Schistosomiasis
- Hookworm
- Chagas Disease
- Leishmaniasis
- Coronavirus Infections
  - SARS CoV
  - SARS CoV2
  - MERS
The antipoverty vaccines

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Abstract

The neglected tropical diseases represent a group of parasitic and bacterial diseases, occurring primarily in rural areas or impoverished urban areas of developing countries. Because of their chronic and stigmatizing character and their impact on child development, pregnancy outcomes, and worker productivity, the neglected tropical diseases are considered poverty-promoting conditions. Through the activities of public-private partnerships, first or second generation recombinant vaccines for three of these conditions—hookworm, leishmaniasis, and schistosomiasis—have undergone early development and clinical testing. However, through the acquisition of extensive bioinformatics information or animal model testing for several other neglected tropical diseases pathogens, it is possible to consider new generation vaccines as well for anemia, Buruli ulcer, Chagas disease, Chlamydia infections (including trachoma), leprosy, leptospirosis, and the treponematoses. Early development of such antipoverty vaccines will require the establishment of product development public–private partnerships and partnerships with innovative developing countries where these diseases are endemic.

Keywords: Neglected tropical diseases; Antipoverty vaccines; Anemia; Buruli ulcer; Chagas disease; Chlamydia infections; Hookworm; Leishmaniasis; Leprosy; Leptospirosis; Schistosomiasis; Treponematoses
Impact of mRNA COVID Immunizations in USA

Estimates of COVID-19 Attributable Deaths, Hospitalizations, and Infections Averted by the U.S. Vaccination Program Between December 12, 2020, and November 30, 2022

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<th>Averted number</th>
<th>95% Credible Interval*</th>
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<tr>
<td>Deaths</td>
<td>3,255,656</td>
<td>3,088,126 to 3,410,112</td>
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<tr>
<td>Hospitalizations</td>
<td>18,585,131</td>
<td>17,780,337 to 19,385,830</td>
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<tr>
<td>Infections</td>
<td>119,851,779</td>
<td>112,698,238 to 127,129,565</td>
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* Credible Intervals reflect the range of uncertainty associated with estimates.

COVID-19 Vaccinations

The unvaccinated population

Land mass scaled to reflect absolute number of unvaccinated (transformed EPSG 3410 equal-area projection)

Developing Country Vaccine Manufacturers Network

- Bangladesh
- China
- India
- Indonesia
- Thailand
- Vietnam
- Argentina
- Brazil
- Cuba

Emerging vaccine manufacturers are innovating for the next decade
Technology Transfer:
India (Corbevax), Indonesia (IndoVac), Bangladesh, S Africa
CORBEVAX (Biological E)

Indovac (BioFarma) Indonesia
IMPLEMENTING THE IMMUNIZATION AGENDA 2030:
A Framework for Action through Coordinated Planning, Monitoring & Evaluation, Ownership & Accountability, and Communications & Advocacy

by 2030, the Immunization Agenda aims to

- Reduce by 50% the number of children missing out on all vaccines
- Achieve 90% coverage for essential vaccines given in childhood and adolescence
- Introduce 500 new vaccines in low and middle-income countries

the impact of childhood vaccination is increasing

#VaccinesWork
IMMUNIZATION AGENDA 2030

30M saved thanks to increased vaccine coverage
40M lives saved thanks to increased vaccine coverage
50M lives saved thanks to increased vaccine coverage

2011-10
2017-19

WHO Immunization Agenda 2030
World Health Organization
Immunization Coverage

Key Facts

▷ Only 25 vaccine introductions other than COVID-19 vaccine were reported in 2021.
▷ Global coverage dropped from 86% in 2019 to 81% in 2021.
▷ An estimated 25 million children under the age of 1 year did not receive basic vaccines, which is the highest number since 2009.
▷ The number of girls not vaccinated against human papillomavirus (HPV) increased by 3.5 million, compared to 2019.
▷ In 2021, the number of completely unvaccinated children increased by 5 million since 2019.
The Concern

- We don’t bounce back
- A new rise in US and global antivaccine activism
- Something new and ominous has happened
New 21st Century Drivers

- Poverty
- War
- Political Instability
- Urbanization
- Deforestation
- Climate Change
- Anti-Science
Antivaccine-Antiscience Ecosystems and Empires

V.1.0 Vaccines and Autism
V.2.0 Politicization Health Freedom
V.3.0 Globalization “The Empire”
V.1.0: Vaccines and Autism
“Moving Goalposts”

- Autism
- MMR
- Thimerosal
- Spacing
- Alum
- HPV
- Infertility
- Autoimmunity
- Chronic Illness
Center for Countering Digital Hate
58 Million Antivaccine Followers

THE DISINFORMATION DOZEN

WHY PLATFORMS MUST ACT ON TWELVE LEADING ONLINE ANTI-VAXXERS

65%

OF ANTI-VACCINE CONTENT CIRCULATING ON MAJOR SOCIAL MEDIA NETWORKING SITES IS TIED TO JUST 12 INDIVIDUALS OR ORGANIZATIONS WHO USE SOCIAL MEDIA TO SPREAD PROPAGANDA ABOUT VACCINES.

COUNTERHATE.COM/DISINFORMATIONDOZEN
Vaccine Scientist, Pediatrician, Parent of Adult Daughter with Autism, and the “OG Villian”

What Does "OG" Mean?

"Original Gangster"

- "OG" is a phrase that is often used in rap and hip hop culture. This later found its way into the internet and texting culture.
- The meaning of "original gangster" is someone who is from "the old school" or someone who has a depth of knowledge or experience. If new gangsters think they are tough, then "OGs" are many times tougher.

Aside from "original gangster," the term "OG" can also mean "old guy." This is a term from the 1940s. It means someone who is an old man but who still is active and is really wanted to be.
V.2.0: Origins of the Health Freedom Movement in Orange CA

The spread of anti-vax sentiment in California

Share of public school kindergartners with personal belief exemptions to vaccination requirements

Source: California Department of Public Health

WASHINGTONPOST.COM/WONKBLOG
Expansion of Health Freedom to Texas

Non-Medical Exemptions 2003-2022

Figure 1. Percent of Students in Kindergarten through 12th Grade with a Conscience Exception on File for at Least One Vaccine

The great Texas COVID tragedy

Peter J. Hotez

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The United States of America leads all high-income nations in COVID-19 deaths, even though as a nation it had the greatest access to antiviral vaccines and therapeutics. To understand this disconnect we can look to the COVID-19 deaths and disability in the State of Texas. Because of COVID-19, Texas is enduring one of the greatest human tragedies in its 186-year history. It did not have to be this way.

According to Texas Department of State Health Services and the major publicly accessible disease trackers from Johns Hopkins University, the University of Washington Institute for Health Metrics and Evaluation (IHME), and The New York Times, the number of deaths from COVID-19 in my home state has reached 94,000 as of September 1, 2022. These numbers place Texas just behind California (by only 1,000–2,000) in the US state with the most COVID-19 deaths, but with a Texas population estimated at 30 million compared to 40 million people living in California the proportion of Texas deaths is higher. Other comparisons—the nation of Canada with 36 million people suffered an estimated 14,000 deaths, while Australia with 25 million experienced 12,000 deaths. It is also worth noting that Texas, Canada, and Australia also share economies of roughly the same size, with a gross domestic product between $2–3 trillion.

To understand why Texas suffered 2-3 times more deaths compared to nations of similar populations and economies, we can look to the patterns of Texas deaths during the pandemic. By May 1, 2021, the Biden White House had made it possible for every adult American to receive a COVID-19 vaccination. However, as shown in Figure 1, the COVID-19 deaths in Texas continued even after vaccines were widely available.

In fact, approximately 40,000 of the 94,000 COVID-19 deaths in Texas occurred after May 1, 2021, when any American who wished to take the COVID vaccine could do so. Data from the Texas Department of State Health Services (Texas DSHS) reports that 80% of COVID-19 deaths in Texas in 2021 occurred among the unvaccinated, while in the first three months of 2022 during the omicron wave the CDC finds rates of death in the US were 20 times higher among unvaccinated people compared to people who were vaccinated and had received a booster. Therefore, the vast majority of the 40,000 deaths occurred among the unvaccinated.

To put those numbers in perspective, just over 60,000 Texas men lost their lives in World War II, while 6,000 died in the 1960s Civil Rights storm and flood. Approximately 500,000 died annually from either gun deaths or road traffic annually, and 1,300 Texans died in its worst indigenous war, the Battle of Medina in 1813.
Daily Trends in Number of COVID-19 Deaths in Texas
Reported to the CDC, per 100,000 population, 2020–2022
Antiscience Kills: 200,000 Americans Needlessly Lost

USA: Up to 40% of Deaths after COVID-19 Vaccines Widely Available After May 1, 2021
THE DEADLY RISE OF ANTI-SCIENCE

A Scientist's Warning

PETER J. HOTEZ, MD, PhD

"Uichtetem es mohit facande rion sqoq sed et quamue." - SOURCE NAME
Sir Joseph Rotblat CBE FRS

“Precepts such as ‘science is neutral’ or ‘science has nothing to do with politics’ still prevail. They are remnants of the ivory tower mentality, although the ivory tower was finally demolished by the Hiroshima bomb.”
Global Vaccinations: New Urgency to Surmount a Triple Threat of Illness, Antiscience, and Anti-Semitism

Peter J. Hotez, M.D., Ph.D.1,2,3,*

1Texas Children’s Hospital Center for Vaccine Development, Department of Pediatrics and Molecular Virology and Microbiology, National School of Tropical Medicine, Baylor College of Medicine, Houston, TX, USA; 2James A. Baker III Institute of Public Policy, Rice University, Houston, TX, USA; 3Department of Biology, Baylor University, Waco, TX, USA; and 4Hagler Institute of Advanced Study and Scowcroft Institute of International Affairs, Texas A&I University, College Station, TX, USA
Will anti-vaccine activism in the USA reverse global goals?

Peter J. Hotez

In the time of the COVID-19 pandemic, anti-vaccine activism in the USA accelerated, amplified and formed an alliance with political groups and even extremists. An organized, well-funded and empowered anti-science movement now threatens to spill over and threaten all childhood immunizations in the USA and globally.
THANKS!

Any questions?
You can find me at

▷ @PeterHotez
Upcoming Immunization Events

▸ Illinois Vaccinates Against COVID-19 (I-VAC): Vaccine Bootcamp
  ▸ Friday, March 3rd from 8am-12:15pm

▸ HPV Awareness Day – HPV Vaccinations
  ▸ Tuesday, March 21st from 12-1pm

Register at illinoisaap.org/events/